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Prevalence of Contagious Mastitis Pathogens on U.S. Dairy Operations, 2007

One of the objectives of the National Animal Health Monitoring System (NAHMS) Dairy 2007 study was to estimate the prevalence of the three major contagious mastitis pathogens on U.S. dairies: *Staphylococcus aureus*, *Streptococcus agalactiae*, and *Mycoplasma* spp. These pathogens generally colonize the teat skin and mammary gland and typically cause a chronic intramammary infection.¹

Background

Cow-to-cow spread of these pathogens typically occurs during milking. Since these pathogens are contagious and the resulting infections chronic in nature, prevention and routine monitoring by milk culture are very important. Although udder infections by any organism typically cause an increase in somatic cell counts (SCC), low SCC does not preclude an infection, even with contagious pathogens.

S. aureus, typically more pathogenic than *S. agalactiae*, causes a greater reduction in milk yield, clinical signs of mastitis, and a variable SCC. Intramammary infections commonly result in microabscesses in the mammary gland, which make antibiotic therapy less successful. Chronic infections with *S. aureus* are common and likely to recur in subsequent lactations.^{1,2}

S. agalactiae is the least pathogenic of the contagious mastitis pathogens, typically causing subclinical infections and a decrease in milk production. Milk yield is reduced due to the destruction of mammary tissue. The typical herd scenario observed with *S. agalactiae* is high SCC but few clinical cases. Most *S. agalactiae* infections can be treated effectively with appropriate intramammary antibiotics, but some chronic cases may not resolve.¹

Mycoplasma spp. commonly resides in a cow's respiratory and urogenital tract, resulting in multiple forms of transmission. Intramammary infections can result in clinical mastitis, elevated SCC, fibrosis of the udder, and a dramatic decrease in milk production. This pathogen requires special culture media and is resistant to all treatments.^{1,3}

Maintaining a closed herd or culturing milk from new additions before bringing them into the herd can help prevent the introduction and/or spread of contagious mastitis pathogens. In addition, cows with *Mycoplasma*

mastitis should be segregated or removed from the herd.¹

The first steps in reducing the spread of contagious mastitis in a herd is to implement recommended milking procedures and identify infected cows through SCC monitoring and milk cultures. Once an infected cow is identified, its milk should not come in contact with uninfected cows via milking equipment or the hands of milkers. Infected cows should be milked last or with a separate milking unit.

Proper milking procedures, a cornerstone of contagious mastitis control, involve the use of gloves, single-use towels, effective pre- and post-milking teat disinfectant, and properly functioning milking equipment. By identifying infected cows and implementing proper milking procedures, contagious mastitis can be successfully controlled.

Dairy 2007 study

The NAHMS Dairy 2007 study estimated the herd-level prevalence of three contagious mastitis pathogens, and evaluated the association between the isolation of these pathogens and herd demographics.

The top 17 dairy States participated in the Dairy 2007 study, with the States divided into West and East regions.* These States accounted for 79.5 percent of dairy operations and 82.5 percent of U.S. milk cows. Participating operations were also divided into three size categories: small (fewer than 100 cows), medium (100 to 499 cows), and large (500 or more cows).

Milk cultures by producers

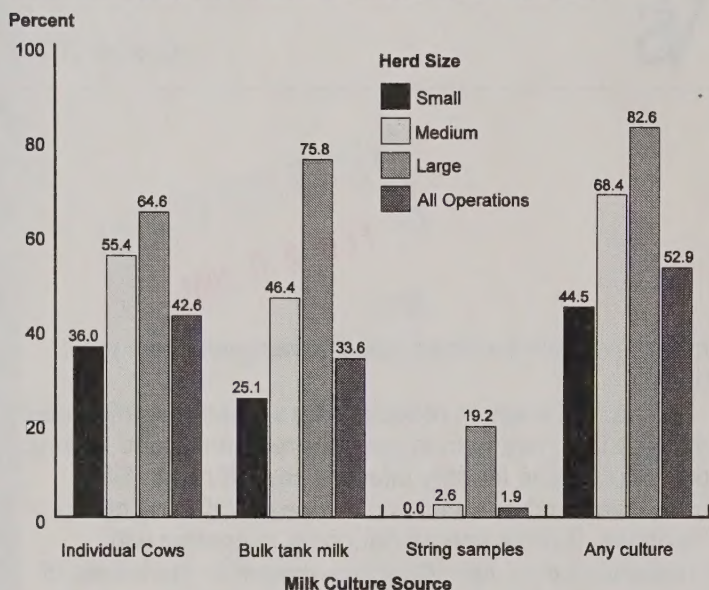
More than half of operations (52.9 percent) performed milk cultures during the previous 12 months. During the 12 months prior to the study, a lower percentage of small operations performed individual cow, bulk-tank milk, string sample, or any milk cultures compared with medium and large operations (figure 1).

*States/Regions:

- **West:** California, Idaho, New Mexico, Texas, and Washington
- **East:** Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, New York, Ohio, Pennsylvania, Vermont, Virginia, and Wisconsin

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Figure 1. Percentage of Operations by Source of Milk Cultures Performed During the Previous 12 Months, and by Herd Size



Chronic clinical cases and clinical cases that did not respond to treatment were the two most common types of cows from which milk was cultured. Of operations that performed cultures on individual cows, a higher percentage of large operations performed cultures on fresh cows and all clinical cases compared with small and medium operations.

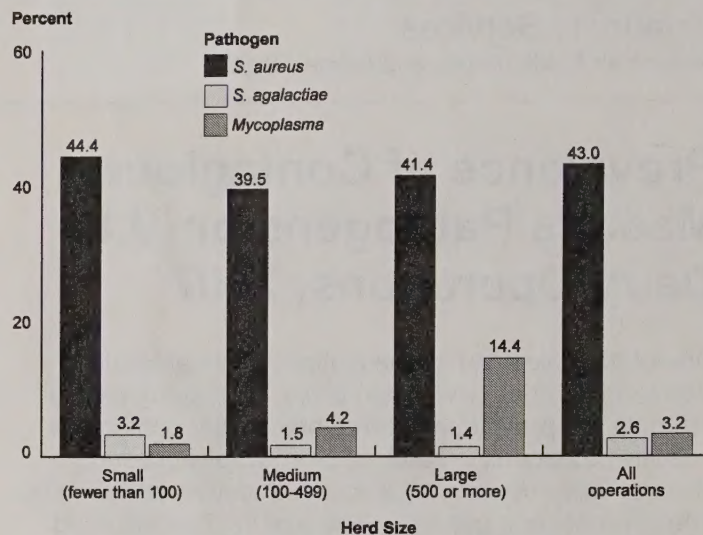
Of operations that performed milk cultures during the previous 12 months, a similar percentage detected *S. aureus* (52.3 percent), *E. coli*/Klebsiella/other gram negative bacteria (53.3 percent), or environmental strep (60.1 percent). A higher percentage of large operations (21.4 percent) and operations in the West region (17.7 percent) identified *Mycoplasma*, compared with medium and small operations (3.8 and 4.0 percent, respectively) and operations in the East region (4.2 percent).

Prevalence of contagious mastitis pathogens on U.S. dairies

To estimate the prevalence of contagious mastitis pathogens on U.S. dairies, a single bulk-tank-milk sample was collected from 534 operations with 30 or more milk cows. These samples were collected from February 28 to August 30, 2007, and cultured using recommended procedures.⁴

Of the three contagious mastitis pathogens, *S. aureus* had the highest herd-level prevalence at 43.0 percent of operations, while *S. agalactiae* and *Mycoplasma* spp. were found on 2.6 and 3.2 percent of operations, respectively. The only herd-size difference in prevalence occurred with *Mycoplasma* spp., which increased as herd size increased (figure 2). No significant regional differences were found in the prevalence of the three pathogens.

Figure 2. Prevalence of Contagious Mastitis Pathogens, by Herd Size



Conclusion

S. aureus is the most prevalent contagious mastitis pathogen in the United States, and its prevalence does not appear to be related to herd size or region. *Mycoplasma* spp. were more frequently isolated in large herds. More than half of operations performed milk cultures during the previous 12 months.

References

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